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A STUDY OF NEW ENGLAND SEISMICITY

by

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1. Abstract

The Earth Resources Lab (ERL) at MIT and the Weston Observatory (WO) of Boston College have collaboratively operated the New England Seismic Network (NESN) for about 20 years. Close cooperation between the two institutions has resulted in the continuation of a viable regional seismic network throughout this period of time to meet the following goals: 1) informing the public and agencies responsible for their safety of current earthquake activity, 2) maintaining as complete a database of regional seismicity as possible for conducting thorough research investigations, 3) conducting a wide variety of research investigations directly related to earthquake hazard mitigation in New England and northeastern North America, and 4) educating the public about earthquake hazard in New England.

In 1994 the MIT contribution to this cooperative effort was evidenced clearly in a number of important areas of operation of the NESN. First, in the area of **seismic station operation** the WO has taken the lead in modernizing the field recording systems of the NESN. During the conversion from the old stations with analog telemetry to the new stations with digital recording at the site, the ERL at MIT has continued to operate five of the old stations to provide a reference for evaluating the performance of the new stations as they are brought on-line and, more importantly, to maintain an adequate regional monitoring presence in New England. In one case, the MIT stations provided valuable local station coverage for the October 1994 earthquake swarm in central Massachusetts to more accurately constrain the locations and magnitudes of the swarm events. MIT is also collaborating with the WO to determine the sites of the new stations. Second, in the area of **data management** the ERL at MIT has assembled a complete archive of waveforms in SAC format for all regional earthquakes recorded digitally by the MIT Seismic Network. In addition, a versatile data dissemination program named SESAME (Seismic Event Server at MIT ERL), which features a database search engine, has been developed and is currently serving waveform data from this archive on-line at the ERL web site. The plan worked out with the WO is to complete the development of SESAME at the ERL and install it at the WO to serve data from a master archive of NESN waveforms (the combined MIT and Weston station data). The plan also calls for converting both the MIT and Weston NESN data in the master archive to SEED format and providing the archive to IRIS. This effort is scheduled to commence in the summer of 1995. SESAME is being designed both to perform parametric searches of the database for research purposes and to provide rapid access to hypocentral data for current earthquakes. Other earthquake information such as epicenter maps and earthquake catalogs is also available using SESAME. Third, MIT and the WO collaborate in the **dissemination of information** about current and past regional seismicity to state and federal agencies, the news media, and the public. A formal procedure for the WO and the ERL to disseminate information quickly to New England state and federal agencies about significant earthquakes in the region was finalized in 1994 under the leadership of the New England States Emergency Consortium (NESEC).